Listing of the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (*Previously Presented*) A method for optimizing the transmission of TCP/IP traffic between a cable modem and a cable modem termination system (CMTS) in a DOCSIS network, comprising the steps of:

(a) determining whether the CMTS supports a dynamic delta encoding header suppression protocol;

(b) transmitting rules to enable the CMTS to reconstruct a packet from the cable modem in accordance with the protocol; and

(c) responsive to a determination that the CMTS does support the dynamic delta encoding header suppression protocol, performing operations including

(i) transmitting fields in a first protocol header of a first TCP protocol packet from the cable modem,

(ii) suppressing a redundant field in a second protocol header of a subsequent TCP protocol packet, and

(iii) transmitting a delta-encoded value for each non-redundant field in said second protocol header of said subsequent TCP protocol packet, wherein said delta-encoded value represents a change in value from a respective non-redundant field in said first protocol header of said first TCP protocol packet.

2. (*Previously Presented*) The method of claim 1, wherein step (i) further comprises the step of transmitting said first TCP protocol packet with an indicator, wherein said indicator indicates that said first TCP protocol packet is to be learned.

3. (*Previously Presented*) The method of claim 1, wherein step (i) further comprises the step of transmitting said first TCP protocol packet in its entirety and transmitting said subsequent protocol header in a compressed format.

4. (*Previously Presented*) The method of claim 1, wherein said subsequent TCP protocol packet includes a bitmapped change byte, wherein bits in said bitmapped change byte indicate at least one non-redundant field in said second protocol header that has said delta encoded value.

5. (*Previously Presented*) The method of claim 1, further comprising the steps of:

(iv) enabling a receiver to learn said first TCP protocol packet,

(v) enabling a receiver to restore said suppressed redundant field in said second protocol header of said subsequent TCP protocol packet using said first TCP protocol packet,

(vi) enabling a receiver to restore a non-redundant field in said second protocol header of said subsequent TCP protocol packet using said respective delta-encoded value, and

(vii) enabling a receiver to provide said restored second protocol header in front of corresponding received data for transmission over an Internet Protocol network.

6. (*Previously Presented*) The method of claim 4, further comprising the steps of:

(iv) enabling a receiver to read said bitmapped change byte,

(v) enabling a receiver to retrieve said delta encoded value using said bitmapped change byte,

(vi) enabling a receiver to update said respective non-redundant field in said second protocol header using said delta-encoded value, and

(vii) enabling a receiver to restore said second protocol header to its original format.

7. (*Previously Presented*) The method of claim 6, further comprising the step of providing said restored second protocol header in front of corresponding received data for transmission over an Internet Protocol network.

8. (*Previously Presented*) A method for receiving packets by a cable modem termination system (CMTS) from a cable modem in a DOCSIS network, comprising the steps of:

(a) receiving a message from the cable modem indicating support for a dynamic delta encoding header suppression protocol;

(b) receiving rules from the cable modem to enable reconstruction of a packet in accordance with the protocol; and

(c) responsive to receiving the message, performing operations including

(i) receiving fields in a first protocol header of a first TCP protocol packet from the cable modem,

(ii) receiving an indication that a redundant field in a second protocol header of a subsequent TCP protocol packet is suppressed, and

(iii) receiving a delta-encoded value for each non-redundant field in said second protocol header of said subsequent TCP protocol packet, wherein said delta-encoded value represents a change in value from a respective non-redundant field in said first protocol header of said first TCP protocol packet.

9. (*Previously Presented*) The method of claim 8, wherein step (i) further comprises the step of receiving an indicator with said first TCP protocol packet, wherein said indicator indicates that said first TCP protocol packet is to be learned.

10. (*Previously Presented*) The method of claim 8, wherein said subsequent TCP protocol packet includes a bitmapped change byte, wherein bits in said bitmapped change byte indicate at least one non-redundant field in said second protocol header that has said delta encoded value.

11. (*Previously Presented*) The method of claim 8, further comprising the steps of:

(iv) learning said first TCP protocol packet;

(v) using learned information from said first TCP protocol packet to reconstruct said suppressed field in said second protocol header of said subsequent TCP protocol packet; and

(vi) using said first TCP protocol packet to reconstruct a non-redundant field in said second protocol header of said subsequent TCP protocol packet.

12. (*Previously Presented*) The method of claim 11, further comprising the step of restoring said subsequent TCP protocol packet to its original format and transmitting said subsequent TCP protocol packet over an Internet Protocol network.

13. (*Previously Presented*) A computer program product comprising a computer useable medium including control logic stored therein, said control logic for optimizing the transmission of TCP/IP traffic between a cable modem and a cable modem termination system (CMTS) in a DOCSIS network, said control logic comprising:

first means for enabling a processor to determine whether the CMTS supports a dynamic delta encoding header suppression protocol;

second means for enabling a processor to transmit rules to enable reconstruction of a packet in accordance with the protocol; and

third means for enabling a processor, responsive to a determination that the CMTS does support the dynamic delta encoding header suppression protocol, to

transmit fields in a first protocol header of a first TCP protocol packet,

suppress a redundant field in a second protocol header of a subsequent TCP protocol packet, and

transmit a delta-encoded value for each non-redundant field in said second protocol header of said subsequent TCP protocol packet, wherein said delta-encoded value represents a change in value from a respective non-redundant field in said first protocol header of said first TCP protocol packet.

14. (*Previously Presented*) The computer program product of claim 13, wherein said third means further comprises means for enabling a processor to transmit said first TCP protocol packet with an indicator, wherein said indicator indicates that said first TCP protocol packet is to be learned.

15. (*Previously Presented*) The computer program product of claim 13, wherein said third means further comprises means for enabling a processor to transmit said first TCP protocol packet in its entirety and transmit said subsequent protocol header in a compressed format.

16. (*Previously Presented*) The computer program product of claim 13, wherein said subsequent TCP protocol packet includes a bitmapped change byte,

wherein bits in said bitmapped change byte indicate at least one non-redundant field in said second protocol header that has said delta encoded value.

17. (*Previously Presented*) The computer program product of claim 13, further comprising:

means for enabling a processor to enable a receiver to learn said first TCP protocol packet;

means for enabling a processor to enable a receiver to restore said suppressed redundant field in said second protocol header of said subsequent TCP protocol packet using said first TCP protocol packet;

means for enabling a processor to enable a receiver to restore a non-redundant field in said second protocol header of said subsequent TCP protocol packet using said respective delta-encoded value; and

means for enabling a processor to enable a receiver to provide said restored second protocol header in front of corresponding received data for transmission over an Internet Protocol network.

18. (*Previously Presented*) The computer program product of claim 16, further comprising:

means for enabling a processor to enable a receiver to read said bitmapped change byte,

means for enabling a processor to enable a receiver to retrieve said delta encoded value using said bitmapped change byte,

means for enabling a processor to enable a receiver to update said non-redundant field in said second protocol header using said delta-encoded value, and

means for enabling a processor to enable a receiver to restore said second protocol header to its original format.

19. (*Previously Presented*) The computer program product of claim 18, further comprising means for enabling a processor to provide said restored second protocol header in front of corresponding received data for transmission over an Internet Protocol network.

20. (*Previously Presented*) A computer program product comprising a computer useable medium including control logic stored therein, said control logic for enabling packets to be received by a cable modem termination system (CMTS) from a cable modem in a DOCSIS network, said control logic comprising:

first means for enabling a processor to receive a message from the cable modem indicating support for a dynamic delta encoding header suppression protocol;

second means for enabling a processor to receive rules from the cable modem to enable reconstruction of a packet in accordance with the protocol; and

third means for enabling a processor, responsive to the message being received from the cable modem, to

receive fields in a first protocol header of a first TCP protocol packet from the cable modem,

receive an indication that a redundant field in a second protocol header of a subsequent TCP protocol packet is suppressed, and

receive a delta-encoded value for each non-redundant field in said second protocol header of said subsequent TCP protocol packet, wherein said delta-encoded value represents a change in value from a respective non-redundant field in said first protocol header of said first TCP protocol packet.

21. (*Previously Presented*) The computer program product of claim 20, wherein said third means further comprises means for enabling a processor to receive an indicator with said first TCP protocol packet, wherein said indicator indicates that said first TCP protocol packet is to be learned.

22. (*Previously Presented*) The computer program product of claim 20, wherein said subsequent TCP protocol packet includes a bitmapped change byte, wherein bits in said bitmapped change byte indicate at least one non-redundant field in said second protocol header that has said delta encoded value.

23. (*Previously Presented*) The computer program product of claim 20, further comprising:

means for enabling a processor to learn said first TCP protocol packet;

means for enabling a processor to use learned information from said first TCP protocol packet to reconstruct said suppressed field in said second protocol header of said subsequent TCP protocol packet; and

means for enabling a processor to use said first TCP protocol packet to reconstruct a non-redundant field in said second protocol header of said subsequent TCP protocol packet.

24. (*Previously Presented*) The computer program product of claim 23, further comprising means for enabling a processor to restore said subsequent TCP protocol packet to its original format and transmit said subsequent TCP protocol packet over an Internet Protocol network.